UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/492,373	01/27/00	HORIKOSHI	Y 991444

023850 IM52/1016
ARMSTRONG,WESTERMAN, HATTORI,
MCLELAND & NAUGHTON, LLP
1725 K STREET, NW, SUITE 1000
WASHINGTON DC 20006

EXAMINER	
SHOSHO, C	
ART UNIT	PAPER NUMBER
1714	7

DATE MAILED: 10/16/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/492,373	Horikoshi et al.
Examiner	**Art Unit**
Callie Shosho	1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Aug 15, 2001*

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1, 2, 4-10, and 14-18* is/are pending in the applica

4a) Of the above, claim(s) _____ is/are withdrawn from considera

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1, 2, 4-10, and 14-18* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirem

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

DETAILED ACTION

1. All outstanding rejections except for those described below are overcome by applicants' amendment filed 8/15/01. Further, the objections with respect to the drawings are overcome in light of the amendment.

The following action is final, however, necessitated by applicants' amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-2, 4-10, and 14-18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants have amended each of claims 1, 14, 16, and 17 to recite that the copolymer has "glass transition point less than or equal to 50^0 C" and have amended claim 4 to recite that the copolymer has a "glass transition temperature of -30 through 50^0 C". It is the examiner's position that these claims fails to satisfy the written description requirement under the cited statute since there does not appear to be a written description requirement for the upper limit of

the glass transition temperature of 50^0 C in the application as originally filed. In re Wright, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163.

Applicant has not pointed to, nor has examiner found, any support in the present specification for claiming the upper limit of the glass transition temperature as 50^0 C. While there is support in the specification on page 7, lines 23-24 of glass transition temperature of "at or below 70^0 C" and "from -30^0 though 70^0 C" and Table 1 discloses copolymers with glass transition temperature both above and below 50^0 C, there is no support for the recitation of 50^0 C as the upper limit of the glass transition temperature in the above cited phrases.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-2, 4-10, and 14-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 14, and 16-17 have been amended to recite that the monomers include "styrene and styrene derivatives" and "alkyl acrylate, alkyl methacrylate, and derivatives thereof". The scope of the claims is confusing because it is not clear what is meant by derivatives. What compounds are encompassed by this phrase? For instance, do alkyl acrylate and alkyl methacrylate derivatives include hydroxyalkyl (meth)acrylates, aminoalkyl (meth)acrylates, etc.?

Each of claims 1, 14, 16, and 17 have been amended to incorporate the limitations of now canceled claims 12 and 13. In paragraph 2(b) of the office action mailed 4/16/01, Paper No. 4, examiner had rejected claims 12 and 13 under 35 USC 112, second paragraph, and stated that claim 12 recites that the copolymer includes "styrene and styrene derivative" while claim 13 recites that the copolymer includes "alkyl acrylate, alkyl methacrylate, and derivative thereof" and in each of the claims it is not clear what is meant by "derivatives".

Applicants have responded that since claims 12 and 13 were canceled, the previous 35 USC 112 rejection of claims 12 and 13 is moot. However, given that the limitations of claims 12 and 13 have been incorporated into claimed 1, 14, 16, and 17, the same 35 USC 112 rejection is now applied against these claims.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-2, 4, 6-10, 14, and 16-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. (U.S. 6,031,019) in view of Patel et al. (U.S. 5,977210).

Tsutsumi et al. disclose ink jet ink comprising 1-30% particle of copolymer obtained from 35-98% monomer such as styrene and its derivatives or alkyl (meth)acrylates, solvent that is liquid at room temperature, and colorant which is a dye or pigment that is either absorbed onto

the surface of the copolymer particle, dispersed in the copolymer particle, or dissolved in the solvent. It is further disclosed that the copolymer is prepared by emulsion polymerization and has a glass transition temperature of 40^0-250^0 C. There is further disclosed an ink cartridge comprising the above ink. Further, it is disclosed that the ink is printed using a recording device that comprises a piezoelectric element and ink cartridge (col.1, lines 9-15, col.3, line 65-col.4, line 36, col.4, line 53-col.5, line 5, col.6, line 65-col.7, line 9, col.8, lines 13-14 and 17-18, col.11, lines 27-51 and 56-60, col.14, lines 41-43, and col.15, lines 40-44).

The difference between Tsutsumi et al. and the present claimed invention is the requirement in the claims of the volume average particle diameter of the copolymer.

On the one hand, given that Tsutsumi et al. produces the copolymer by emulsion polymerization as presently claimed, it would have been natural for one of ordinary skill in the art to infer that the copolymers intrinsically possess the same volume average particle diameter as presently claimed, and thus one of ordinary skill in the art would have arrived at the claimed invention.

On the other hand, Patel et al., which is drawn to ink jet inks, disclose the use of copolymer having volume average particle size of 0.1-1 micron in order to produce an ink that will not clog the printer nozzles (col.3, lines 14-15 and col.4, lines 57-59).

In light of the motivation for using copolymer having specific volume average particle diameter disclosed by Patel et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use copolymer with such volume average particle diameter in the

ink of Tsutsumi et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. in view of Patel et al. as applied to claims 1-2, 4, 6-10, 14, and 16-18 above, and further in view of either *Polymer Science Dictionary* or Fujisawa et al. (U.S. 5,997,136).

The difference between Tsutsumi et al. in view of Patel et al. and the present claimed invention is the requirement in the claims of the softening temperature of the copolymer.

On the one hand, given that Tsutsumi et al. discloses copolymers identical to those presently claimed, i.e. obtained from the same types and amounts of monomers, it would have been natural for one of ordinary skill in the art to infer that the copolymers intrinsically possess the same softening temperature as presently claimed, and thereby arrive at the claimed invention. Evidence to support this position is found in *Polymer Science Dictionary* (page 526) which discloses that the value of the softening point for polymers lies in the vicinity of the glass transition temperature of the polymer. Given that Tsutsumi et al. disclose copolymer having glass transition temperature identical to that presently claimed, it is clear, in light of the teaching in *Polymer Science Dictionary*, that the softening temperature of the copolymer of Tsutsumi et al. will also overlap the softening temperature as presently claimed.

On the other hand, Fujisawa et al., which is drawn to ink jet inks, disclose that the softening temperature of polymers utilized in ink jet inks range from 50^0 -120^0 C wherein such

temperature allows the ink to be heated quickly so that the ink dot is formed before penetration of ink into recording medium occurs so that feathering of the ink on the recording medium is prevented (col.3, lines 13-35).

In light of the motivation for using copolymer with specific softening temperature disclosed by Fujisawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use copolymer with such softening temperature in the ink of Tsutsumi et al. in order to produce an ink which does not feather, and thereby arrive at the claimed invention.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. in view of Patel et al. as applied to claims 1-2, 4, 6-10, 14, and 16-18 above, and further in view of Nkansah et al. (U.S. 5,962,580).

The difference between Tsutsumi et al. in view of Patel et al. and the present claimed invention is the requirement in the claims of surfactant covering a surface of the copolymer.

Tsutsumi et al. disclose a surfactant and copolymer, but there is no explicit disclosure in any of the references that the surfactant covers a surface of the copolymer.

On the one hand, given that the surfactant and copolymer are mixed together in Tsutsumi et al. in order to produce an ink, it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer as a result of the mixing process, and thereby arrive at the claimed invention.

On the other hand, Nkansah et al., which is drawn to aqueous coating compositions, disclose the use of polymer covered with surfactant in order to improve the color acceptance of the composition (col.1, lines 38-50 and col.4, lines 5-20).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to cover the surface of the copolymer with surfactant in the ink of Tsutsumi et al. in order to produce an ink that has improved color acceptance, and thereby arrive at the claimed invention.

10. Claim 1-2, 4, 8-10, 14, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (U.S. 5,977,210) in view of Satake et al. (U.S. 5,814,685).

Patel et al. disclose an ink jet ink comprising copolymer particle obtained from monomers including styrene and butyl acrylate, solvent that is liquid at room temperature, and colorant which is dispersed in solvent wherein the copolymer particle has volume average diameter of 0.1-1 micron. It is further disclosed that the copolymer is prepared by emulsion polymerization. It is further disclosed that the ink is printed using ink jet printer including those comprising piezoelectric head where such ink jet printer would inherently possess an ink cartridge which would house the ink (col.1, lines 6-7 and 64-67, col.2, lines 56-61, col.4, lines 51-66, col.5, lines 22-26, col.6, lines 58-60, col.7, lines 36-38).

The difference between Patel et al. and the present claimed invention is the requirement in the claims of the glass transition temperature of the copolymer as well as the amount of monomer which comprise the copolymer.

While example 1 of Patel et al. discloses a copolymer comprising 18% butyl acrylate and 82% styrene and possessing glass transition temperature of 60^0 C, this is only one preferred embodiment of Patel et al. A fair reading of the reference as a whole broadly discloses the use of several copolymers including those obtained from styrene, butyl acrylate, and acrylic acid (col.4, lines 61-64). Further, it is well known, as found in Satake et al., that the glass transition temperature of a polymer is controlled by the type and amounts of monomer which comprise the monomer and further that the glass transition temperature in turn effects the water resistance, dispersibility, and viscosity of the ink (col.3, line 53-col.4, line 19).

In light of the above, it would have been obvious to one of ordinary skill in the art to control the amount of monomer as well as the glass transition temperature to amounts, including those presently claimed, in Patel et al. in order to produce an ink with suitable water resistance, dispersibility, and viscosity, and thereby arrive at the claimed invention.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. in view of Satake et al. as applied to claims 1-2, 4, 8-10, 14, and 16-18 above, and further in view of Fujisawa et al. (U.S. 5,997,136).

The difference between Patel et al. in view of Satake et al. and the present claimed invention is the requirement in the claims of the softening temperature of the copolymer.

Fujisawa et al., which is drawn to ink jet inks, disclose that the softening temperature of polymers utilized in ink jet inks range from 50^0 -120^0 C wherein such temperature allows the ink

to be heated quickly so that the ink dot is formed before penetration of ink into recording medium occurs so that feathering of the ink on the recording medium is prevented (col.3, lines 13-35).

In light of the motivation for using copolymer with specific softening temperature disclosed by Fujisawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use copolymer with such softening temperature in the ink of Patel et al. in order to produce an ink which does not feather, and thereby arrive at the claimed invention.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. in view of Satake et al. as applied to claims 1-2, 4, 8-10, 14, and 16-18 above, and further in view of Nkansah et al. (U.S. 5,962,580).

The difference between Patel et al. in view of Satake et al. and the present claimed invention is the requirement in the claims of surfactant covering a surface of the copolymer.

Patel et al. disclose a surfactant and copolymer, but there is no explicit disclosure in any of the references that the surfactant covers a surface of the copolymer.

On the one hand, given that the surfactant and copolymer are mixed together in Patel et al. in order to produce an ink, it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer as a result of the mixing process, and thereby arrive at the claimed invention.

On the other hand, Nkansah et al., which is drawn to aqueous coating compositions, disclose the use of polymer covered with surfactant in order to improve the color acceptance of the composition (col.1, lines 38-50 and col.4, lines 5-20).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to cover the surface of the copolymer with surfactant in the ink of Patel et al. in order to produce an ink that has improved color acceptance, and thereby arrive at the claimed invention.

Response to arguments

13. Applicants arguments regarding Belmont et al. (U.S. 5,630,868), Jones et al. (U.S. 5,936,008), EP 767225, JP 379678, and JP 10120957 have been carefully considered but are moot in view of the discontinuation of these references as applied against the present claims.

14. Applicants' arguments filed 8/15/01 have been fully considered but they are not persuasive.

Specifically, applicants argue that none of the cite references disclose glass transition temperature and volume average particle size as presently claimed.

It is agreed that Tsutsumi et al. do not explicitly disclose the volume average particle size of the copolymer. However, on the one hand, given that Tsutsumi et al. disclose that the copolymer is made using emulsion polymerization as presently claimed, it would have been natural for one of ordinary skill in the art to infer that the copolymers intrinsically possess the

same volume average particle diameter as presently claimed. On the other hand, this is why Tsutsumi et al. is used in combination with Patel et al. which teaches the use of copolymers having volume average particle size as presently claimed.

Further, it is agreed that Patel et al. do not explicitly disclose the glass transition temperature of the copolymer as presently claimed. However, this is why Patel et al. is used in combination with Satake et al. which teaches that the glass transition temperature of a polymer is controlled by the type and amounts of monomer which comprise the polymer and further that the glass transition temperature in turn effects the water resistance, dispersibility, and viscosity of the ink. In light of this, it therefore would have been obvious to one of ordinary skill in the art to control the amount of monomer as well as the glass transition temperature in Patel et al. to amounts, including those presently claimed, in order to produce an ink with suitable water resistance, dispersibility, and viscosity.

Applicants also argue that none of the cited references teach or suggest a method to realize superior self-fixing due to self-film shaping. However, it is noted that the claims are drawn to a composition or an article, not a method. Additionally, given that each of the cited references either alone or in combination disclose ink as presently claimed, it therefore would have been natural for one of ordinary skill in the art to expect that these inks would intrinsically possess superior self-fixing due to self-film shaping

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie Shosho whose telephone number is (703) 305-0208. The examiner can normally be reached on Mondays-Thursdays from 7:00 am to 4:30 pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

CS

Callie Shosho
10/12/01

Vasu Jagannathan

VASU JAGANNATHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700